Message

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Sent: 1/22/2018 9:50:39 PM
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Subject: STICS: Clearance Completion: #ORD-022061: An analysis of cumulative risks based on biomonitoring data for six phthalates using the Maximum Cumulative Ratio

The clearance for this Human Health Risk Assessment product is complete:

- **Product type, subtype:** Journal Article, Peer Reviewed
- **Product title:** An analysis of cumulative risks based on biomonitoring data for six phthalates using the Maximum Cumulative Ratio
- **Author(s):** Reyes, J and P. Price
- **Initiator:** PaulS Price,ord/nerl/ced
- **ORD Tracking Number:** Tracking # ORD-022061
- **Product Description / Abstract:** The Maximum Cumulative Ratio (MCR) quantifies the degree to which a single chemical drives the cumulative risk of an individual exposed to multiple chemicals. Phthalates are a class of chemicals with ubiquitous exposures in the general population that have the potential to cause adverse health effects in humans. This work used the MCR to evaluate coexposures to six phthalates as measured in biomonitoring data from the most recent cycle (2013–2014) of the National Health and Nutrition Examination Survey (NHANES). The values of MCR, Hazard Index (HI), and phthalate-specific Hazard Quotients (HQs) were determined for 2663 NHANES participants aged six years and older by using reverse dosimetry techniques to calculate steady-state doses consistent with concentrations of metabolites of six phthalates in urine and using Tolerable Daily Intake values. There were 21 participants (0.8% of the NHANES sample) with HI > 1. Of those, 43% (9/21) would have been missed by chemical-by-chemical assessments (i.e. all HQs were less than one). The mean MCR value in the 21 participants was 2.1. HI and MCR values were negatively correlated (p 1 was not driven by age, gender, or ethnicity. The cumulative exposures of concern largely originated from a subset of three of the fifteen possible pairs of the six phthalates. These findings suggest that cumulative exposures were a potential concern for a small portion of the surveyed participants involving a subset of the phthalates explored. The largest risks tended to occur in individuals whose exposures were dominated by a single phthalate.
- **Tracking and Planning**
  - Task ID: 3.233
  - Task: Applying Epigenetic Data to Cumulative Risk
  - Product Title: N/A - Not Applicable
  - Product Description: N/A - Not Applicable
  - Project: Cumulative Risk Assessment Methods and Applications
  - Topic: Community and Site-specific Risk
  - Research Program Area: Human Health Risk Assessment

- **Product Category:** Does not require Advance Notification
- **QA form attached in STICS?:** No
- **QAPP Reference:** N/A
- **Keywords:**
  - Cumulative exposures
  - Cumulative risk
  - Phthalates
  - Children's Environmental Health

- **Journal Name:** ENVIRONMENT INTERNATIONAL
- **DOI:** https://doi.org/10.1016/j.envint.2017.12.008
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